

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE GENERAL SPECIFICATION**

**IRRIGATION WATER CONVEYANCE  
(High Pressure Underground Plastic Pipeline)  
(ft.)**

**CODE 430-DD**

**1. SCOPE**

*The work shall consist of furnishing and installing high pressure underground plastic pipe, fittings, and appurtenances as specified*

**2. LOCATION**

*The pipeline shall be located as shown on furnished drawings or as staked in the field.*

**3. PUBLIC AND PRIVATE UTILITIES**

*Utilities are defined to be overhead and underground power or communication lines, and pipelines. All utilities discovered to be in the work area are shown on the drawings or sketches. However, the absence of indicators on the drawings or sketches does not assure the nonexistence of utilities in the work area. The contractor is alerted to conduct his/her own search and discovery for utilities in order to lessen or avoid potential damages. The owner/operator shall complete TX-ENG-80, UTILITIES INVENTORY prior to layout or any ground disturbance and return it to an NRCS representative.*

**4. MINIMUM DEPTH OF COVER**

Pipe shall be installed at sufficient depth below the ground surface to provide protection from hazards imposed by traffic crossings, farming operations, freezing temperatures, or soil cracking. The minimum depth of cover for pipe susceptible to any of these hazards, shall be:

Pipe diameter (in.)	Depth of Cover (in.)
1/2 through 2 1/2	18
3 through 5	24
6 or more.	30

Conservation practice general specifications are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

## GS-430-DD-2

In areas where the pipe will not be susceptible to freezing and vehicular or cultivation hazards and the soils do not crack appreciably when dry, the minimum depth of cover may be reduced to:

Pipe diameter (in.)	Depth of Cover (in.)
½ through 1 ½	6
2 through 3	12
4 through 6	18
6 or more.	24

At low places on the ground surface, extra fill may be placed over the pipeline to provide the minimum depth of cover. The top width of the fill shall then be no less than 10 ft and the side slopes no steeper than 6:1. If extra protection is needed at vehicle crossings, encasement pipe or other approved methods may be used.

**Special case cranberry bogs** - In cranberry bogs where the pipe is not susceptible to freezing and heavy equipment is never allowed, minimum depth of cover may be 6 in. for a 6-in. diameter pipe and 12 in for a larger pipe. The minimum cover for polyethylene pipe is 6 in. The minimum cover for PVC pipe in cranberry bogs, where the pipe is to be protected from freezing after winter flooding, shall be 12 in, if the winter flood equals or exceeds 12 in. When the winter flood is less than 12 in, the top of the pipe shall be at least 24 in below the water surface. Solvent-welded joints shall be used at all connections of PVC pipe where peat and muck exist in their normal layered pattern. Rubber gasket joints may be used following normal bedding procedures where coarse sand or cement layers exist.

## 5. TRENCH CONSTRUCTION

The trench at any point below the top of the pipe shall be only wide enough to permit the pipe to be easily placed and joined and to allow the initial backfill material to be uniformly placed under the haunches and along the side of the pipe. The maximum trench width shall be 36 in greater than the diameter of the pipe. If the trench is precision excavated and has a semicircular bottom that closely fits the pipe, the width shall not exceed the outside diameter of the pipe by more than 10 percent.

The trench bottom shall be uniform so that the pipe lies on the bottom without bridging. Clods, rocks, and uneven spots that can damage the pipe or cause non-uniform support shall be removed. If rocks, boulders, or any other material that can damage the pipe are encountered, the trench bottom shall be under-cut a minimum of 4 in below final grade and filled with bedding material consisting of sand or compacted fine-grained soils.

Pipelines having a diameter of ½ through 2 ½ in that are to be placed in areas not subject to vehicular loads and in soils that do not crack appreciably when dry may be placed by using "plow-in" equipment instead of conventional trenching.

Provisions shall be made to insure safe working conditions where unstable soil, trench depth, or other conditions can be hazardous to personnel working in the trench.

## **6. PLACEMENT**

Care shall be taken to prevent permanent distortion and damage when handling the pipe during unusually warm or cold weather. The pipe shall be allowed to come within a few degrees of the temperature it will have after it is completely covered before placing the backfill, other than that needed for shading, or before connecting the pipe to other facilities. The pipe shall be uniformly and continuously supported over its entire length on firm stable material. Blocking or mounding shall not be used to bring the pipe to final grade.

For pipe with bell joints, bell holes shall be excavated in the bedding material, as needed, to allow for unobstructed assembly of the joint and to permit the body of the pipe to be in contact with the bedding material throughout its length.

## **7. JOINTS AND CONNECTIONS**

All joints and connections shall be designed and constructed to withstand the design maximum working pressure for the pipeline without leakage and to leave the inside of the line free of any obstruction that may tend to reduce its capacity below design requirements. All fittings, such as couplings, reducers, bends, tees, and crosses, shall be installed according to the recommendations of the pipe manufacturer.

Fittings made of steel or other metals susceptible to corrosion shall be adequately protected by being wrapped with plastic tape or coated with a substance that has high corrosion-preventative qualities. If plastic tape is used, all surfaces shall be thoroughly cleaned and coated with a primer compatible with the tape before wrapping.

## **8 THRUST BLOCKS**

Thrust blocks must be formed against a solid hand-excavated trench wall undamaged by mechanical equipment. They shall be constructed of concrete, and the space between the pipe and trench wall shall be filled to the height of the outside diameter of the pipe or as specified by the manufacturer.

**9. TESTING.**

The pipeline shall be tested for pressure strength, leakage, and proper functioning. The tests may be performed before backfilling or anytime after the pipeline is ready for service.

Tests for pressure strength and leaks shall be accomplished by inspecting the pipeline and appurtenances while the maximum working pressure is maintained and all joints and connections are uncovered, or by observing normal operation of the pipeline after it is put into service. Partial backfills needed to hold the pipe in place during testing shall be placed as specified in "Initial Backfill." Any leaks shall be repaired and the system retested. The pipeline shall be tested to insure that it functions properly at design capacity. At or below design capacity there shall be no objectionable flow conditions. Objectionable flow conditions shall include water hammer, continuing unsteady delivery of water, damage to the pipeline, or detrimental discharge from control valves.

**10. INITIAL BACKFILL.**

Hand, mechanical, or water packing methods may be used.

The initial backfill material shall be soil or sand that is free from rocks or stones larger than 1 in. in diameter. At the time of placement, the moisture content of the material shall be such that the required degree of compaction can be obtained with the backfill method to be used. The initial backfill material shall be placed so that the pipe will not be displaced, excessively deformed, or damaged.

If backfilling is done by hand or mechanical means, the initial fill shall be compacted firmly around and above the pipe as required to provide adequate lateral support to the pipe.

If the water packing method is used, the pipeline first shall be filled with water. The initial backfill before wetting shall be of sufficient depth to insure complete coverage of the pipe after consolidation. Water packing is accomplished by adding enough water to diked reaches of the trench to thoroughly saturate the initial backfill without excessive pooling. After the backfill is saturated, the pipeline shall remain full until after the final backfill is made. The wetted fill shall be allowed to dry until firm before beginning the final backfill.

**11. FINAL BACKFILL.**

The final backfill material shall be free of large rocks, frozen clods, and other debris greater than 3 in. in diameter. The material shall be placed and spread in approximately uniform layers so that there will be no unfilled spaces in the backfill and the backfill will be level with the natural ground or at the design grade required to provide the minimum depth of cover after settlement. Rolling

equipment shall not be used to consolidate the final backfill until the specified minimum depth of cover has been placed. All special backfilling requirements of the pipe manufacturer shall be met.

## **12. MATERIALS**

Irrigation Water Conveyance-High-pressure, Underground, Plastic Pipeline, Material Specifications shall be followed with regard to materials used.

## **13. BASIS OF ACCEPTANCE**

The acceptability of the pipeline shall be determined by inspections to check compliance with all the provisions of this standard with respect to the design of the line, the pipe and pipe marking, the appurtenances, and the minimum installation requirements.

## **14. CERTIFICATION AND GUARANTEE**

*All materials shall conform to these minimum requirements and to the tests prescribed in the applicable ASTM Specification. If requested by the state conservation engineer, a qualified testing laboratory must certify with supporting test results that the pipe meets the requirements specified in this specification. The seal of approval of a recognized laboratory on pipe bearing one of the ASTM designations listed in this standard may be accepted for this certification.*

*The installing contractor shall certify to the purchaser that the materials and installation comply with the requirements of these specifications. He shall furnish the purchaser a written guarantee against defective workmanship and materials to cover a period of not less than one year. He shall record on the guarantee the manufacturer's name and markings of the installing high pressure underground plastic pipe used.*

*The installing contractor shall furnish the Natural Resource Conservation Service a copy of his certification and guarantee, which will be made a part of the supporting records of the pipeline.*

## **15. MEASUREMENT**

*The amount of pipeline completed as specified will be determined by measuring the length, in feet, of each size and kind of pipe installed.*

## **16. CONSTRUCTION DETAILS**